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ABSTRACT

In 1989, a study was conducted of the academic achievement of Harrisburg (Pennsylvania) Area Community College (HACC) students who transferred to State University I (SUI) during the fall semesters of 1983, 1984, and 1985. A total of 81 students were identified and their academic records were tracked through the end of the spring semester 1989. Variables examined on SUI transcripts included academic major, credits earned, numbers of semesters enrolled, credits transferred, first semester's and cumulative grade point average (GPA), and whether a bachelor's degree (B.A.) was earned. In addition, information from the students' HACC transcripts was analyzed, including credits earned, cumulative GPA, academic major, and whether an associate in arts (A.A.) degree was earned. Study findings included the following: (1) cumulative GPA for transfers at SUI was 2.55 (compared with an average GPA of 2.71 for native SUI students), although transfer students' GPA's improved steadily after the first semester at the four-year institution; (2) by the end of spring 1989, a total of 43 (53.1%) of the HACC transfer students had completed all requirements for the B.A. degree, less than the completion rate of 64% for native SUI students 6 years after entry; (3) among the 38 transfer students who had not yet obtained a B.A., 12 had completed 90 or more credits at SUI; and (4) HACC achievement variables did not have a significant impact on any of the long-term achievement variables among transfer students at the senior institution, such as obtaining a B.A. or cumulative GPA, although short-term correlations were found with regard to GPA earned at the two institutions. An analysis of student performance by discipline, and detailed data tables are included. (JMC)

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ACADEMIC ACHIEVEMENT OF HACC TRANSFERS TO STATE UNIVERSITY I

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October 1989

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Abstract
Academic Achievement of HACC Transfers to State University I 1984-86

The mounting concern related to the degree of academic achievement attained by the Harrisburg Area Community College (HACC) transfer population proved to be the primary impetus for this study. Data was obtained for all HACC students who transferred to State University I during the Fall Semesters of 1983-85. A total of 81 students were identified and their academic records were tracked through the end of the Spring 1989 Semester.

In reviewing the individual State University I transcripts, the following information was collected: academic major; credits earned; number of semesters enrolled; credits transferred; first semester and cumulative GPA; and whether or not the BA was earned. Besides the State University I data, information was also obtained from the students' HACC transcript. This included the following: credits earned; cumulative GPA; academic major; and whether or not an AA degree was awarded. Additionally, the demographic sex, age, and ethnic/race variables were appended to the data file.

What outcomes did this HACC transfer sample produce? In general, they fared very well when matched to the native State University I students. Their overall GPA was 2.55 compared to the university average of 2.71. While the transfers had a lower cumulative GPA, much of this can be attributed to the "transfer shock" experienced by many during their first semester. From a low of 2.37 after their initial semester, HACC transfers who persisted did very well (especially those with AA degrees who earned an overall GPA of 2.80).

By the end of the Spring, 1989 Semester, a total of 43 HACC transfers had completed all requirements for their BA (53.1%). Again, this was less than the reported 64% average (after six years) of native State University I students, but it does suggest that many HACC transfers did achieve their major educational goal. Also, it is important to note that an additional twelve students had earned 90 credits or more (including transfer credits) and the percentage graduating from this sample would exceed sixty plus if only half of the twelve earned their BA. This, of course, would mean that no meaningful difference would be found between HACC transfers and native State University I students in perhaps the most significant long-term educational measure.

While comparison between transfers and native students is important, the results of the study suggest another critical finding. This focused primarily on HACC based achievement variables and the relationship/affect they had on subsequent State University I outcomes. The data analysis indicated that HACC based factors did not have a significant impact on the obtainment of the BA degree or any other of the selected long-term (e.g. number of semesters enrolled; cumulative GPA, etc.). This meant that it made little or no difference whether an AA was completed, or whether one had high grades or not, or whether one had a certain academic major over another. For the BA outcome, HACC achievement variables did not play an important role.

Even though HACC outcomes were not significant to the long-term BA variable, they did have an impact on the short-term measures. For example, students who earned a high GPA at HACC generally continued this pattern during their first semester at State University I. This in turn influenced the eventual completion of the BA degree as those who earned a high first semester GPA at State University I were more likely to graduate. Also, the findings showed that students who persisted at HACC, earning 45 credits or more, were more likely to complete their BA degree requirements even though possession of an AA was not critical.

HACC transfers did succeed but it is apparent that continual effort is required to improve and strengthen instruction and programs on campus and enhance the transfer function between schools.

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I. Introduction

One of the most important issues higher education must address in the 1990's is that of "assessment". More and more, educational institutions such as Harrisburg Area Community College (HACC) will be asked, or even required, to provide information related to such measures as faculty productivity, resource allocation, and academic program review. Increasingly, much of the impetus which moves higher education to evaluate various aspects of its operation has come from external organizations and agencies and not primarily driven by institutionally derived factors and/or forces.

Generally, institutions have found that initiating various assessment activities has given them far more flexibility in deciding not only what to evaluate but also how to go about it. No where is this more true than in the area of assessing student educational outcomes. A common, yet important measure which many community colleges have examined is how their students have fared upon transfer to a senior, bachelors degree (BA) granting institution. Particular emphasis for this kind of study has generally focused on graduation rate, GPA, credits transferred, and credits earned once a community college student matriculates to a senior institution. These outcomes are vital to any community college that services a large transfer program for several reasons.

First, outcome assessment data allows the community college to evaluate the quality and relevancy of its own programs and courses in relationship to the expected skills senior colleges demand. Next, student outcome assessment can provide the base measure by which community colleges can determine whether alteration or deletion in their transfer programs and courses should take place. Finally, and perhaps most importantly, this type of assessment provides critical information to students who plan to enroll in a transfer curriculum. The basis for students entering any transfer program is the assumption that one's educational opportunities are not limited but actually expanded.

Due to the value of such information, the Research Office at HACC completed a study of students who transferred to State University I over a three year period. Information related to GPA, graduation, semesters enrolled, credits transferred, grades in upper division courses, and academic major were

obtained. Unlike the annual Graduate Follow-Up Surveys, this assessment project did not rely on student reported outcomes. Rather, academic achievement data at the senior school were obtained directly from student transcripts following strict research guidelines and federal regulations related to a study of this nature. This report is the first of a series which will assess the achievement level of HACC's transfer students. Future studies are planned for State University II and a branch of Research University I.

II. Methodology

State University I was selected as one of the study sites primarily because of the number of HACC students who have transferred there. Information provided by the central office of the State System of Higher Education (SSHE) showed that State University I was the second most popular public supported state institution in terms of HACC transfers, preceded only by State University II.

Prior to meeting with officials at State University I, discussions were held between the Director of Institutional Research for the State System and two representatives from HACC, Assistant Dean of Records and Research, Doug Hargis, and the Coordinator of Institutional Research, Glen Lum during the Spring, 1989 Semester. Various issues and concerns related to the feasibility of this study were considered and the decision was made that such an assessment would be valuable to both HACC and the State System. Contact was then made with the Registrar at State University I and the specifics of the study fully reviewed. Of special concern was the examination of individual student transcripts and the Family Educational Rights and Privacy Act (FERPA) governing the release of such information. All research activities associated with this project strictly adhered to FERPA regulations. Data were reported in aggregate form only insuring that individual students would not be identified.

In order to determine the overall level of academic achievement, all students who matriculated to State University I during the fall semesters of 1983, 1984, and 1985 were included in this study. Transcripts were examined through

the Spring, 1989 Semester allowing students a minimum of four years to complete all BA requirements upon enrollment at State University I. This parameter was critical since many students at HACC enrolled on a part-time basis and they would require more than two years to complete their BA should they continue this pattern. An on-site visit was made to obtain transcript data in August, 1989.

A total of 81 HACC students were identified as having transferred to State University I during the fall semesters of 1983-85. A transcript by transcript review sought the following information: total credits earned at State University I; total credits transferred from HACC; first semester GPA; cumulative GPA; number of semesters enrolled at State University I; year graduated; academic major; and performance in upper division courses. It should be noted that one of the important differences in this study versus the Graduate Follow-Up Survey was the inclusion of all HACC transfers whether or not they graduated with an AA degree. Thus, important differences between graduates and non-graduates could be examined.

Not only were general outcome measures examined but specific course performance from a wide range of disciplines was obtained. Course grades utilized in this study included for the following: the first two courses listed on the State University I transcript for education, psychology, history, management, English composition, and literature; the first three listed for nursing, computer science, and physics; 12 different math courses; seven accounting, and six each in biology and chemistry.

Besides the information on the State University I transcript, a number of comparison outcome variables based on each student's HACC academic record were appended to their data file. This information included total HACC credits earned; cumulative HACC GPA; whether or not a degree was earned; and HACC major. In addition, grade achievement in a number of selected HACC courses was duly noted on the data file and included the following list:

English 051 - English Essentials
English 101 - Composition I
English 102 - Composition II
English 104 - Technical Writing
English 106 - Business Communication
Math 020 - Beginning Algebra
Math 051 - Intermediate Algebra
Math 103 - College Algebra
Math 104 - Trigonometry
Math 109 - for Social Science I
Math 113 - for Elementary Teachers
Math 119 - Pre-Calculus
Math 121 - Calculus I
Education 101 - Fundamentals
History 103/104 - U.S. History
History 201/202 - West Civilization
Psychology 101 - General
Management - First course
Computer Science - First course
Physics 201 - General Physics
Chemistry 121 - Principles
Chemistry 101 - General Chemistry I
Chemistry 102 - General Chemistry II
Chemistry 203 - Organic Chemistry I
Accounting 101 - Principles I
Accounting 102 - Principles II
Accounting 201 - Intermediate I
Accounting 202 - Intermediate II
Biology 101 - General I
Biology 102 - General II
Biology 121 - Anatomy & Physiology
Biology 212 - Botany
Literature - First course

Finally, demographic information related to sex, age at time of transfer, and ethnic/race were included in the analysis.

A data file was created for each student combining information from State University I and HACC. This was accomplished using the dBase III software package. All statistical analyses were completed utilizing the SPSS statistical software. The report will first review the descriptive results and discuss their implications. This will provide a sound basis for examining both bivariate and multivariate relationships between the appropriate variables. Finally, the report closes by reviewing the most significant findings and how they affect HACC's transfer programs and students.

III. Descriptive Analysis

A. Demographic

A review of the descriptive analyses will cover information obtained from the sample State University I transcripts plus data found on the HACC master student file. While specific course grade information was gathered from both institutions, detailed discussion related to course performance will be

highlighted only when it is deemed appropriate. The major emphasis will be placed on examining overall academic performances at State University I and HACC while specific course outcome data will play a supporting rather than primary role in this study. All descriptive results can be found in Appendix A.

Females numbered 53 (65.4%) out of the 81 HACC students who transferred to State University I during the fall semesters of 1983-85. This ratio matches fairly close to the six to four, female to male ratio generally found on the HACC campus during the 1980's. The age at time of transfer to State University I ran from 18 to 45 years old with a mean of 22.3 years. While the range was relatively wide, the mean age suggests that most transfers fell in the traditional (18-22 years) college age category. Indeed, upon closer inspection, this was precisely the case as nearly three out of four students (N=69 or 74.1%) were 22 years old or younger. Given that State University I is a residential school with a majority of full-time (FT) students, it is not surprising that most transfers could be found in the traditional college age group.

Finally, the ethnic/racial distribution generally mirrored the numbers found on recent graduation lists. Over nine out of ten (N=74 or 91.4%) transfers were white, five were Asians (6.2%), while Blacks and Hispanics were represented by a single student each. The low Black and Hispanic totals were likely the result of several factors. First, the number of Black and Hispanic graduates have historically been underrepresented at HACC. Not only have Blacks and Hispanics been more difficult to recruit but their attrition rate has also been higher. This cannot but have a negative effect on the numbers who qualify to transfer. Another factor may be the location of State University I and the inability and/or unwillingness of many minorities to commute such distances (35 or more miles) on either a FT or PT basis should they decide not to live on campus. Cost is certainly important, program choices, and even the campus social milieu are all considerations which may have impacted on the minority (especially Blacks and Hispanics) transfer rate.

B. HACC Student Characteristics

Prior to transferring, HACC students earned anywhere from three to 93 credit hours. The mean credits earned was 48.1 with 61.7% (N=50) earning more than

45 credit hours. Fewer than one in four (N=18 or 22.2%) earned less than 30 credits and only five (6.2%) completed less than 12 credit hours. Clearly, most students who did transfer to State University I made extensive use of their opportunities at HACC and many left having completed a significant portion of their BA degree requirements. Since five transferred after earning fewer than 12 credits, this suggests that these students likely wanted to meet specific course requirements for State University I during their short tenure at HACC.

In terms of the grades earned at HACC, the GPAs ranged from a low of 1.63 to a high of 4.00. The mean GPA of 2.73 was above the college wide mean of 2.56 (for Fall, 1988). The higher GPA came as no surprise since gaining admission to State University I is competitive. A closer examination of the data revealed that two students earned less than a 2.00 average and both had completed more than 30 credits at HACC. It is unknown how these two gained admission to State University I (or why State University I would admit them) given that their low GPA would not even qualify them for an AA degree even if all other program requirements were met. State University I did favor academically stronger HACC students since 52 (or 64.2%) earned a 2.50 GPA or higher. Students with an AA degree had a mean GPA of 2.96, far exceeding the overall college average.

Reviewing the distribution of academic major at HACC, the largest contingent of students were from the Business Division (N=24 or 29.6%). This was followed closely by those from the Social Science Division (N=22 or 27.2%) and then the General Studies Program (N=12 or 14.8%). Most of the social science and general studies students were either pre-education at HACC or they went on to declare an education major (primarily elementary) after transferring to State University I. Since State University I has a long history in the teacher education field, it does not come as a surprise that so many HACC transfers matriculated into this discipline. Also, the historic prevalence of females in the elementary education field was likely an important factor as to why they outnumber males nearly two to one in this sample. Indeed, out of 22 social science majors, 18 (81.8%) were females and most were pursuing (N=13) a degree in the education field. This was also the case with general studies majors (eight out of 12 selected education as their field of study at State University I).

Of the 81 transfers, 30 (37.0%) had earned an AA degree from HACC while one other student completed a certificate program. These numbers clearly attest to the notion that many (if not most) students do not seek an AA degree as part of their community college experience since they transferred from HACC prior to completing their degree. Thus, any study which relies solely on HACC graduates will not provide a complete picture of the numbers who transfer or their level of academic achievement at a BA granting institution.

C. State University I Characteristics

Having reviewed the descriptive HACC academic achievement elements of this sample, the report will now focus on their State University I record. Again, specific course outcomes will not be analyzed. Rather, discussion related to grades in various courses will be covered in the bivariate section as supporting data when analyzing academic performance.

After transfer to State University I, HACC students earned from three to 120 credit hours (seven earned 100 or more) with the mean number equal to 57.8 credits. Upon further investigation, those who completed requirements for a BA degree (N=43) earned an average of 80.2 credits versus a subgroup mean of those who held an AA degree and then earned a BA (N=19) of 70.8 credits. Thus it would appear that many students who complete the transfer process even with an AA were required to earn more than the 60-64 additional credits normally needed for their BA degree.

The number of transfer credits accepted by State University I ranged from three to 76 hours. The mean for this group was equal to 40.5 credits with 11 students showing more than 60 accepted hours and seven fewer than twelve. The mean figure is a direct function of whether or not one graduated from HACC with an AA degree. Recall that only 30 students earned an AA so most transferred with less than 60 credits. Even some of the 30 graduates lost a few credits in the transfer process since only 16 students were awarded 60 or more credit hours. These results underscore the need for all students to plan carefully and early when considering the transfer process. It also suggests how valuable an articulation agreement between the two schools would be in helping students plan their long term educational goal.

One of the key performance variables in any transfer study is the first semester GPA earned at the senior college. For HACC transfers, the grades ranged from a low of .25 to a high of 4.00 (one student withdrew and did not return). Was the so-called first semester "transfer shock" found among HACC students given the results from their first semester of courses at State University I? The data would support this contention. HACC students, who transfer with an average GPA of 2.73, earned only a mean GPA of 2.37 after their first semester at State University I. While it is a considerable drop, the result followed past patterns found in other studies (see Astin, 1977; Cohen and Brawer, 1982; Karabel, 1986; Nunley and Breneman, 1988).

Not only did the mean GPA fall after the first semester, but the number of students who did not earn a 2.00 or higher average also jumped. Recall that two students (2.4%) left HACC and entered State University I with GPAs less than 2.00. However, after their first semester at State University I, 22 (27.2%) HACC transfers had semester GPAs less than the 2.00 required for graduation. On the other hand, 23 students earned a 3.00 GPA or higher which matched exactly the number who transferred with HACC GPAs in that range.

Does it appear that HACC students encounter academic difficulties not heretofore experienced prior to their transfer? The data showed that the first semester at State University I was a period of transition academically for many HACC students. Major adjustments were required by some to cope with the new academic requirements as well as other accompanied changes which had to be addressed after moving to a new institution. A number of students found it difficult to accustom themselves to the new academic demands and their new environment. This was reflected in no small way by their lower GPA. Others had far fewer problems, indeed, many made the transition from one school to another rather easily. Suffice it to say that while the mean first semester GPA at State University I was lower than the mean GPA earned at HACC, a great deal of variation was found among individuals in this study.

After experiencing lower grades overall during their first semester, were HACC transfers able to adapt to their new institution and improve their GPA? In order to assess this, the first semester mean GPA was compared to the cumulative mean GPA for courses taken only at State University I. The results did show that after the first semester, grades (as measured by GPA) did go up.

The GPA rose from 2.37 to 2.55 while the number of students on academic probation (less than 2.00) fell from 22 to 18. Conversely, the number of students who carried a 3.00 GPA or higher also fell, but only slightly from 23 to 22. The 2.55 GPA of HACC transfers compares fairly closely to the 2.71 overall cumulative GPA earned by all State University I students at the end of the Spring 1989 semester. Transfers who completed an AA degree did even better as they posted a cumulative GPA of 2.80.

This grade distribution pattern clearly indicated that after an initial period of adjustment, HACC transfers were able to improve their academic record. Even though it was not at the level achieved at HACC, significant strides were made to ameliorate their poor performance of the first semester. It is also important to note that transfers who were able to continue past the first semester, even if they were unsuccessful academically, were more likely to show an improvement in their overall GPA. Thus, first semester achievement should not be the the primary criterion upon which senior institutions use to assess the academic achievement level of their transfer population. Rather, activities which would increase persistence among transfers appears to be the direction an institution should move as the long term benefits (e.g. producing graduates) would far outweigh any short-term cost.

One important indicator of persistence is the number of semesters a student enrolled once he/she arrive on the State University I campus. Of the 81 students in the sample, nearly one out of four (N==0 or 24.7%) registered for either one or two semesters (six stayed only one semester). The mean number of semesters enrolled was 5.4 with a high of 13 (summer included). With an average of over five, this generally enables a FT student who transfers 50-60 credits sufficient time to complete requirements for a BA degree. Again, the importance of persistence cannot be understated. Students (FT) who are able to remain at school beyond the first transfer year will likely graduate since many would have attained senior status by then.

The final variable under discussion is the number of students who transfer to State University I and succeed in earning their BA/BS degree. A total of 43 out of 81 students (53.1%) who transferred from HACC during the Fall Semesters of 1983-1985 had completed all BA requirements by the Spring, 1989 (May). In addition, out of 38 non-graduates, 15 students had 75 or more credits toward

their BA with 12 from their group having earned 90 or more credits. It is likely a few, if not most of those with 90 hours or more will continue to work toward and finally receive their BA.

By comparison, the graduation rate of all State University I students reported by the Registrar's Office was 64% after six years. Again, HACC transfers matched favorably with their peers and even though their initial percentage was lower, the potential for increasing this figure in the next year or so is still very good. For example, if only six of the 12 transfers with 90 plus credits graduate, the percentage of BA completers would be 60.5% (49/81).

While the 50 plus percentage figure is encouraging, it is not enough to examine just how many were successful. Rather, determining why this was the case can prove to be vital if steps are to be taken to improve the graduation rate. To this end, the report will now examine various factors which may have affected attrition/persistence and completion.

IV. Bivariate Analysis

A. HACC Achievement Variables

In order to gain a better understanding of HACC transfers and their level of academic achievement and persistence at State University I, it is valuable to compare differences between these students based on their performance at the community college. For example, one may want to determine whether AA degree holders outperformed those who transferred without completing a two year program. The chi square analyses will match HACC academic outcomes plus two demographic variables to selected achievement outcomes earned at State University I. Age and sex were the demographics utilized in this study while the HACC variables included degree earned, credits earned, GPA, and academic major. State University I matching factors included credits earned, transfer credits, first semester GPA, cumulative GPA, semesters enrolled, academic major, and completion of the BA degree.

To begin, the sex and age demographic variables were paired to the State University I outcomes. The results showed that it made no significant difference whether one was male or female when matched to the level of

academic achievement at State University I. The only variable where a trend could be discerned was cumulative GPA. Females tended to be in the mid GPA range (2.00-2.99) while males were found proportionally more often at both the high (greater/equal 3.00) and low (less than 2.00) end. However, the chi square statistic for this pair was not significant at the .05 level (.054).

When the age variable (at time of transfer) was matched to credits earned at State University I, first semester, and cumulative GPA the resulting data varied greatly from group to group. Students in the traditional college age range (17-22 years) were far more likely to have completed 60 or more State University I credits than older students. This should not come as a surprise since a residential school such as State University I normally attracts a greater number of students who are more apt to attend on a FT basis and thus have an opportunity to complete more credits in a short time. Many studies have shown that a strong correlation exist between age (17-22 years) and student status (FT attendance).

While traditional students tended to earn more credits, students over 22 years old generally had higher grades. This was especially true with the cumulative GPA variable at State University I. Proportionally more students over 22 years were distributed in the 3.00 or higher GPA compared to those in the traditional age group. Thus, a dichotomous relationship was found. On one hand, traditional age students, attending FT were more likely to complete a greater number of credits, yet older, PT students were apt to perform at a higher level for the classes they do take. The contingency coefficient (CC) which measures the strength of the relationship, was a fairly strong .56. The distribution pattern for age and cumulative GPA, with accompanied statistics can be found in Table 1.

Table 1
Chi Square - Age by Cumulative GPA

	Less Than 20 Years	20-22 Years	23-25 Years	26-29 Years	30-39 Years	Greater/Equal 40 Years	Total
Less Than 2.00	3	12	2	0	1	0	18
	16.7%(r)	66.7%(r)	11.1%(r)	0	5.6%(r)	0	22.2%
	13.6%(c)	31.6%(c)	22.2%(c)	0	16.7%(c)	0	
2.00-2.49	4	7	2	2	0	0	15
	26.7%(r)	46.7%(r)	13.3%(r)	13.3%(r)	0	0	18.5%
	8.2%(c)	18.4%(c)	22.2%(c)	40.0%(c)	0	0	
2.50-2.99	13	10	2	1	0	0	26
	50.0%(r)	38.5%(r)	7.7%(r)	3.8%(r)	0	0	32.1%
	59.1%(c)	26.3%(c)	22.2%(c)	20.0%(c)	0	0	
3.00-3.49	0	7	2	1	4	0	14
	0	50.0%(r)	14.3%(r)	7.1%(r)	28.6%(r)	0	17.3%
	0	18.4%(c)	22.2%(c)	20.0%(c)	66.7%(c)	0	
Greater/Equal 3.50	2	2	1	1	1	1	8
	25.0%(r)	25.0%(r)	12.5%(r)	12.5%(r)	12.5%(r)	12.5%(r)	9.9%
	9.1%(c)	5.3%(c)	11.1%(c)	20.0%(c)	16.7%(c)	100.0%(c)	
	22	38	9	5	6	1	81
	27.2%	46.9%	11.1%	6.2%	7.4%	1.2%	100.0%

Chi Square=36.878 DF=20 Signif.=.012 Contingency Coefficient=.56
r=row percentage c-column percentage

Next, the study will move to the HACC outcome variables. When academic major at HACC was paired to the State University I outcomes, no important differences were found with credits transferred, credits earned (at State University I), first semester and cumulative GPA, and semesters enrolled. Of course, when this variable was matched to the academic major at State University I the result was significant, but one would logically expect this to occur as most students continued with the same program even after transferring.

Several important findings came from the examination of the HACC GPA factor. First, and not totally surprising, students with HACC GPAs between 2.50 and 3.49 transferred the most credits. Upon closer inspection, transfers who carried grades in the 2.50-3.49 GPA range were more likely to graduate with an AA which in turn meant they had generally completed more courses than non-degree students.

Did the quality of work, as measured by the first semester and cumulative GPA at State University I vary greatly between students with different HACC GPAs?

The chi squares showed that it did. Students who did well at HACC generally maintained their high achievement levels. This was more evident with the first semester GPA (Sign.=.000; CC=.61) than the cumulative average as the very high (over 3.49) and very low (less than 2.00) students started to move toward the middle range (2.50-3.49) after one term. Recall how the number of transfers with less than a 2.00 fell from 23 to 18 students. Students with HACC GPAs less than 2.50 were far more likely to experience difficulties and be placed on academic probation after transferring to State University I. Cumulative grade distribution from both HACC and State University I can be found in Table 2.

Table 2
Chi Square - HACC GPA by Cumulative State University I GPA

State University I / HACC	Less Than 2.00	2.00-2.49	2.50-2.99	3.00-3.49	Greater/Equal 40 Years	Total
Less Than 2.00	2	10	4	1	1	18
	11.1%(r)	55.6%(r)	22.2%(r)	5.6%(r)	5.6%(r)	22.2%
	100.0%(c)	37.0%(c)	13.8%(c)	6.3%(c)	14.3%(c)	
2.00-2.49	0	5	9	0	1	15
	0	33.3%(r)	60.0%(r)	0	6.7%(r)	18.5%
	0	18.5%(c)	31.0%(c)	0	14.3%(c)	
2.50-2.99	0	10	10	3	3	26
	0	38.5%(r)	38.5%(r)	11.5%(r)	11.5%(r)	32.1%
	0	37.0%(c)	37.0%(c)	18.8%(c)	18.8%(c)	
3.00-3.49	0	2	5	6	1	14
	0	14.3%(r)	35.7%(r)	42.9%(r)	7.1%(r)	17.3%
	0	7.4%(c)	17.2%(c)	37.5%(c)	14.3%(c)	
Greater/Equal 3.50	0	0	1	6	1	8
	0	0	12.5%(r)	75.0%(r)	12.5%(r)	9.9%
	0	0	3.4%(c)	37.5%(c)	14.3%(c)	
	2	27	29	16	7	81
	2.5%	33.3%	35.8%	19.8%	8.6%	100.0%

Chi Square=41.232 DF=16 Signif.=.000 Contingency Coefficient=.58
r=row percentage c-column percentage

Next, an examination of the total number of HACC credits earned and how it related to the selected State University I outcomes will be considered. Certainly one would expect that students earning more HACC credits would in all likelihood transfer more credits to State University I. This in turn would mean that fewer State University I credits would be required to complete a BA degree. The statistical analyses supported this conclusion. The relationship between accepted transfer credits to HACC credits earned proved

to be especially strong (Signif.=.000; CC=.74). An interesting discovery revolved around the relationship between HACC credit hours and first semester GPA at State University I. Students with 46 or more transfer credits tended to be in the 2.50 to 3.49 GPA range at the conclusion of their first term. However, those who transferred fewer HACC credits tended to have earned lower grades their first semester. From an academic performance perspective, HACC may want to encourage students to complete the AA degree before transferring.

Earlier analyses indicated that overall HACC GPA also influenced GPA earned the first semester at State University I. The data supports the contention that HACC students who were successful academically during their first semester, had already succeeded at the community college level (2.50-3.49) and also persisted three or more FT semesters (45 or more credits). Also, it is important to note that most credits earned at HACC generally were transferable to State University I. While some HACC students lost credits in the transfer process, those who planned early and carefully fared very well. Again, this shows the value of sound advising both at State University I and HACC and securing transfer information as soon as it is feasible. Decision related to the selection of the senior institution and academic major also plays a pivotal role in determining the number of transferable credits. The distribution for HACC credits earned to credits accepted by State University I is listed in Table 3.

Table 3
Chi Square - HACC Credits Earned by Credits Transferred to State University I

State Univ I Transfer HACC Credits	Less/Equal 15	16-30	31-45	Greater/Equal 46	Total
Less/Equal 15 Credits	6	0	0	0	6
	100.0%(r)	0	0	0	7.4%
	60.0%(c)	0	0	0	
16-30 Credits	3	13	0	0	16
	18.8%(r)	81.3%(r)	0	0	19.8%
	30.0%(c)	61.9%(c)	0	0	
31-45 Credits	1	4	4	0	9
	11.1%(r)	44.4%(r)	44.4%(r)	0	11.1%
	10.0%(c)	19.0%(c)	30.8%(c)	0	
Greater/Equal 45 Credits	0	4	9	37	50
	0	8.0%(r)	18.0%(r)	74.0%(r)	61.7%
	0	19.0%(c)	69.2%(c)	100.0%(c)	
	10	21	13	37	81
	12.3%	25.9%	16.0%	45.7%	100.0%

Chi Square=102.999 DF=9 Signif.=.000 Contingency Coefficient=.748
r=row percentage c= column percentage

Having concluded a review of the HACC GPA, credits earned, and academic major factors, attention will now turn to the impact the AA degree had on the selected State University I's outcome variables. Since all AA degree requires a minimum of 60 credits, this variable influenced the number of credits accepted for transfer. Holders of the AA degree transferred more credits simply because, with a few exceptions, they completed more courses. Any other finding would certainly have come as a surprise.

Besides transfer credits, degree holders also influenced both first semester and cumulative GPA. Since the data already revealed how total HACC credits earned affected the first semester at State University I, one could logically assume that differences would exist between those who held an AA versus those who did not. Similar to the total HACC credits earned variable, degree holders tended to fall in the 2.50 to 4.00 range whereas transfers without a degree were overrepresented in the two lowest GPA categories (Signif.=.000; CC=.536).

While this relationship also held true for cumulative State University I GPA, it was not nearly as pronounced as the results obtained matching the first semester GPA (Signif.=.024; CC=.422). Perhaps this is best explained by reviewing the distribution pattern for the first semester and cumulative GPA again. Recall that both the highest (greater/equal 3.50) and lowest (less than 2.00) GPA categories had their largest representation after the first semester but more and more students gradually moved into the mid-range (2.00-3.49) grade brackets in succeeding terms. This suggests that the variables associated with HACC had their greatest impact initially but much of their influence was mitigated by other factors after a number of semesters at State University I. In the next section discussion will focus on the selected State University I outcome variables.

Perhaps no other achievement associated with transferring is as important as completing all BA degree requirements. To determine what, if any weight HACC performance variables had on BA degree attainment, a chi square was completed for each pair. The results certainly were somewhat unexpected. None of the HACC achievement variables (AA degree, GPA, credits earned, and academic major) nor any demographics proved to be statistically significant. This meant that it made no difference whether one held an AA degree or had high grades or completed 30 or more credits, or had a particular academic major. Neither did it matter whether one was a male or female, young (less than 23) or old. For example, while 19 out of 31 (61.3%) of all AA/certificate graduates held BA's, 24 out of 50 (48%) non-HACC graduates earned a four year degree. Thus, the differences between AA graduates and non-graduates were not great enough to be statistically important.

Upon further consideration, and given the trend found when the AA degree variable was joined with both first semester and cumulative GPA, the fact no HACC achievement nor demographic factor play an important role in determining whether a BA degree was earned or not fits nicely with the previous findings. These results showed that some HACC based factors did influence the level of academic achievement when a student transferred to State University I. However, it was shown that the HACC variable played a diminishing role with each passing semester. Thus, total HACC credits earned and the AA degree were significant factors in determining first semester GPA at State University I but their role lessened extensively when analyzed against cumulative GPA.

Following logic, if one assumes that meeting all BA degree requirements is the end goal furthest removed in time from when the transfer took place, then none of these HACC variables should have had a significant impact on any long-term State University I outcome.

Does this mean that one's preparation at HACC means little or nothing in determining academic success or failure at State University I? Certainly not! One can intuitively understand without requiring a vast array of data and statistics that the educational experience gained at HACC, or any other like institution, can and does play a positive role in affecting subsequent academic achievement. However, instead of viewing only long-term outcomes, a second methodology suggests that shorter and intermediate outcomes at transfer schools be considered. From these, one can then determine what influence these shorter outcomes (e.g. first semester GPA at State University I) have on long-term goals (e.g. BA degree). The complete list of HACC variables matched to attainment of the BA degree can be found in Table 4.

Table 4
Chi Square - HACC Outcome Variable by BA Degree Attainment

Variables	Chi Square	Degree of Freedom	Significance	Contingency Coefficient
Sex by BA Degree	.407	1	.523	.096
Age by BA Degree	4.316	5	.504	.224
AA Degree by BA Degree	1.978	2	.371	.154
HACC Credits by BA Degree	2.006	3	.571	.155
HACC GPA by BA Degree	3.825	4	.430	.212
HACC Major by BA Degree	3.292	5	.655	.197

B. State University I Variables

Having examined the relationships between various HACC achievement variables and selected demographics to the BA degree outcome, attention will now be focused on the extent certain State University I's factors affect this specific goal. Thus, the primary question will consider whether BA degree holders are characterized by certain academic factors associated by their experience at State University I. For this analysis, these variables have been matched with the BA degree outcome; total State University I credits

earned; total transfer credits accepted from HACC; first semester GPA; cumulative GPA; number of semesters enrolled; and academic major.

Since transfer students normally must earn 60 or more credit hours (which generally requires a minimum of four semesters) to complete a BA, even if they hold an AA degree, the total number of State University I credits earned and semesters enrolled reflected this requirement. Not surprisingly, students who earned 60 or more credits (Signif.=.000; CC=.621) and registered for five or more semesters (Signif.=.000; CC=.566) were far more likely to graduate. The contingency coefficient (strength of the relationship) is lower for the semester enrolled variable primarily due to the PT status of a number of students.

When the number of transfer credits from HACC was analyzed, no significant differences were uncovered. This finding underscores what was discovered in the previous section where HACC outcome variable played a diminished role in determining long-term goals at State University I. Since credits transferred is a closely allied with both total HACC credits and the AA degree, little wonder that important differences were not found. However, while the transfer credits variable was not significant, it did show a trend toward students who had more than 30 hours (Signif.=.085; CC=.274).

First semester GPA at State University I provided a sound basis for determining completion of a BA while cumulative GPA was even stronger. Students who fell in the mid range (2.00-3.50) after the first semester were more likely to earn a BA. Academic performance rose even higher with the cumulative State University I GPA variables as BA degree holders were more apt to fall in the upper categories only (2.50-4.00). This distribution can be found in Table 5.

Table 5
Chi Square - Cumulative State University I GPA by Attainment of BA Degree

SUI GPA	Less Than 2.00	2.00-2.49	2.50-2.99	3.00-3.49	Greater/Equal 3.50	Total
BA						
Yes	0	8	20	10	5	43
	0	18.6%(r)	46.5%(r)	23.3%(r)	11.6%(r)	53.1%
	0	53.3%(c)	76.9%(c)	71.4%(c)	62.5%(c)	
No	18	7	6	4	3	38
	47.4%(r)	18.4%(r)	15.8%(r)	10.5%(r)	7.9%(r)	46.9%
	100.0%(c)	46.7%(c)	23.1%(c)	28.6%(c)	37.5%(c)	
	18	15	26	14	8	81
	22.2%	18.5%	32.1%	17.3%	9.9%	100.0%

Chi Square=28.476 DF=4 Signif.=.000 Contingency Coefficient=.643
r-row percentage c-column percentage

Finally, while academic major was obtained only for those who graduated, it is important to examine to what extent State University I graduates changed their major from the time they left HACC to the time they graduated with their BA degree. It was already shown that the academic major variable at HACC did not play a significant role in determining whether or not a BA was earned but did students initiate a significant number of curriculum changes after they transferred and if so, in what field did these changes occur?

Returning to an earlier analysis matching the HACC major to the BA major, a number of students did switch disciplines. The most prominent changes occurred with business majors as over half (6/10 or 60%) earned a BA in another field. Of those who did change from business, three entered a technical field while the others moved into the liberal arts/social sciences. Conversely, those who were education/social science majors at HACC were least likely to change (1/14). These numbers suggest that one's academic major at State University I may be an important variable in program completion but further analysis will be required before such a claim can be fully supported. Certainly, a lot of movement did take place from major to major and it appears that proportionally more was associated with those coming to State University I as business students.

The bivariate analyses did show a number of critical, and some surprising relationships. From these, three important conclusions can be drawn. First,

selected HACC and demographic outcomes did have an impact on the achievement level of those transferring to State University I. While a number of statistically significant relationships existed, they varied greatly from one variable to another. The second important characteristic to note was the diminishing influence HACC outcome variables had over time. For example, HACC GPA played an important role in determining first semester GPA after transfer, but it was less so (though significant) with cumulative State University I GPA, and it mattered almost not at all when it came to the total credits earned at State University I. Likewise, this was generally true with the total HACC credits, AA degree, and HACC major variables. Ultimately, none of the HACC outcome or selected demographics proved to be of value when paired with perhaps the most important, long-term educational goal, attainment of the BA degree.

The third conclusion suggested by the bivariate analyses was the influence State University I variables had to earning a BA. Except for the total number of HACC credits accepted for transfer, all State University I variables were significant to program completion. While this may be true, the chi square statistics did show how the HACC variables affected a number of State University I variables. HACC GPA, while not significant to the BA factor, certainly influenced the cumulative State University I GPA. The cumulative State University I GPA in turn acted on the BA completion rate. Thus, it is easy to distinguish some of the vital interactions between the variables. In the next section, several independent variables will be run jointly to differentiate the influence they have on the dependent BA program completion variable when acting together. These ANOVAs, or multivariate statistics, provide further in-depth examination into the role HACC plays in helping transfer students succeed.

C. Subsequent Course Performance by Discipline

From a departmental standpoint, one of the most interesting and valuable results of this project was to ascertain how HACC students performed once they transferred to a senior college or university. This is especially critical for disciplines which follows a rigid, prerequisite course pattern such as mathematics or accounting. However, while the value of matching HACC courses to subsequent upper division courses at State University I is not in question, the small sample size (N=81) often does not allow for meaningful comparisons.

For example, 14 students completed Math 119 (Pre-Calculus) at HACC but only four took Calculus I at State University I. Another example saw 23 students with credit for Math 051 (Intermediate Algebra), yet only two continued on with college algebra and five with the beginning math for elementary education teaching (HACC's Math 113). For the most part fewer than ten, and in many cases less than five students were found in upper division or even beginning college level courses at State University I. Thus, these low numbers make it impossible to provide the type of valid and reliable statistics that can be reported for most of the courses identified in this study.

However, several subject areas proved to be promising and while not actually sequential by design, it does allow for some interesting and perhaps valuable comparisons. These findings may be particularly valuable for the academic division and department of the subject under review. In selecting the specific courses to be analyzed, the primary criterion was student enrollment both at HACC and at State University I. Four disciplines were considered, education, English, history, and psychology. Since an investigation of subsequent academic achievement was the primary focus, enrollment figures for these specific HACC courses were obtained; Education 101, English 102, History 103, and Psychology 101. The course figures were then matched to the <u>first</u> course taken at State University I in the said discipline and course grade comparisons were conducted. In the case of English 102, the analysis used the first literature course taken. See Appendix B for actual course grade from HACC and Appendix C for the State University I's results.

Once the pairings were completed, only English (N=26) and psychology (N=21) had more than 20 students who registered for courses in these disciplines at both schools (education had 14, history 11). What did the bivariate grade distribution at HACC and State University I reveal for psychology and English? The results were certainly mixed. Neither psychology nor English were statistically significant. This means that the grades earned at HACC for English 102 and Psychology 101 <u>did not</u> play a critical role in determining the grade received in the first literature or psychology course at State University I. Again, it should be emphasized that neither English nor psychology follow strict prerequisites when compared to other disciplines such as mathematics. Nevertheless, it is interesting to note that a student who earns an "A" grade at HACC in English 102 was just as likely to earn a "C" in

literature at State University I as he/she was to repeat the "A" grade. Conversely, one can view the positive side by saying that a "C" student would just as likely earn an "A" grade as he/she was to repeat the "C". The same scenario can be repeated for the psychology results.

What does this all mean? Does HACC provide the necessary background for their transfer students to succeed? Certainly one can assert that even with twenty plus students, it is difficult to draw any definitive conclusions. This would be a correct response, though it would then lessen the value of studies such as this one. Perhaps a more appropriate response would be to suggest that achieving success at HACC does not guarantee subsequent success nor does average work at HACC permanently assign a student to academic mediocrity. For HACC, it is apparent that continued efforts to improve classroom instruction and heighten academic expectations must be pursued. Current educational issues such as "accountability" and "standards" must not be overlooked, but these terms can only have constructive meaning if they ultimately enhance student learning. Certainly, the wide dispersion found among HACC transfers would indicate that departments must be concerned about the baseline expectations among their faculty related to these and other courses.

While the above comments are valid, one must also remember a vital point. No subsequent course achievement occurs solely based on what is or is not accomplished at HACC. Other factors can and do come into play and they also greatly affect achievement at State University I. HACC's primary objective must be to provide the type and quality of education which will give each student a real opportunity to reach their educational/career goal and further their intellectual and aesthetic growth. The chi square distribution for English 102 and the State University I literature course is listed in Table 6. Other comparisons for specific courses can be completed by request to the Research Office.

Table 6

Chi-Square - HACC English 102 Grade by State University I Literature Course Grade

Literature / English 102	A	B	C	D	F	Total
A Grade	1	2	1	0	0	4
	25.0%(r)	50.0%(r)	25.0%(r)	0	0	15.4%
	25.0%(c)	18.2%(c)	11.1%(c)	0	0	
B Grade	3	5	4	0	1	13
	23.1%(r)	38.5%(r)	30.8%(r)	0	7.7%(r)	50.0%
	75.0%(c)	45.5%(c)	44.4%(c)	0	100.0%(c)	
C Grade	0	3	4	1	0	8
	0	37.5%(r)	50.0%(r)	12.5%(r)	0	30.8%
	0	27.3%(c)	44.4%(c)	100.0%(c)	0	
W Grade	0	0	0	1	0	1
	0	0	0	100.0%(r)	0	3.8%
	0	0	0	9.1%(c)	0	
	1	1	9	11	4	26
	3.8%	3.8%	34.6%	42.3%	15.4%	100.0%

Chi Square=7.362 DF=12 Signif.=.832 Contingency Coefficient=.469

r=row percentage c=column percentage

V. Multivariate Analysis

Having reviewed the bivariate relationships between selected HACC and State University I outcomes variables, this portion will examine how these variables interacted together in a number of multivariate analysis. While the ANOVA analyses will examine various State University I outcome variables, the main focus will be those factors which affected the completion of the BA degree. Due to the limitations imposed by computer memory space, only three independent variables were analyzed to the dependent variable at any given time. Of course this restricts some important analyses when four or more independent factors needed to be computed together but what is available certainly expands HACC's understanding of the achievement level of its transfers.

When the independent variables total HACC credits earned, HACC GPA, and AA degree were matched to the dependent BA degree completion factor, none were significant in the ANOVA analysis. Recall that the earlier chi square results did show that none of these HACC based variables significantly influenced this outcome. Even when they were taken together, this did not greatly increase their affect on the BA outcome variable.

In the next analysis, the State University I based variables total credits earned, cumulative GPA, and number of transfer credits were grouped and run against the BA completion outcome. The total credits and number of transfer credits were significant to BA completion in the chi square analysis thus the ANOVA will provide additional information related to the value of these independent variables when paired together. The finding from the ANOVA showed that total State University I credits was still a statistically significant factor but this was not the case for the other two variables. The number of transferable credits variable ceased to explain a significant amount of variance and this was very likely due to its close relationship with total State University I credits earned. In addition, cumulative GPA, which had a strong relationship to BA degree completion in the chi square analysis, no longer played an important role in explaining the variance. Whereas, the bivariate relationship indicated that students with GPAs of 2.5 or higher were more likely to gain their BA, the ANOVA suggest that the grades themselves were not an important function in determining whether one earned the required number of credits. Suffice it to say that having high grades would not hurt one's chance of completing, but high grades alone is not a guarantee of a BA. Other, more important variables, played a greater role.

Students who earned 60 or more credits were far more likely to earn a BA than those who earned fewer credits. Of course, students who earn an AA at HACC must complete an additional 60 or more credit hours minimum so one would expect such a distribution pattern. Perhaps one would have logically concluded that a stronger influence should have been shown by the total transfer credit variable since it is significant to total State University I credits earned when paired in a bivariate analysis (Signif.=.000; CC=.56). That the transfer credit variable did not play a greater role in the ANOVA reinforces the notion that the affect of HACC based outcomes lessened over the long-term.

The ANOVA results for BA degree completion by State University I credits earned, cumulative GPA, and total transfer credits accepted is given in Table 7.

Table 7

ANOVA - BA Degree by State University I Credits, Transfer Credits, and Cumulative GPA

Source of Variation	Sum of Squares	DF	Mean Squares	F	Signif.
Main	13.592	10	1.35	14.45	.000
State Univ I Cred Earned	5.896	3	1.96	20.90	.000
Transfer Credits	.150	3	.05	.53	.662
Cumulative GPA	.781	4	.19	2.07	.093
Explained	13.592	10	1.35	14.45	.000
Residual	6.581	70	.09		
Total	20.173	80	.25		

This particular ANOVA was a strong predictive model since it explained over 67% of the variance. To further examine the value of the total State University I credits earned variable on BA degree completion, the total number of semesters enrolled variable was included in an ANOVA along with cumulative GPA. Since there is a strong relationship between semesters enrolled and credits earned (Signif.=.000; CC=.72) this ANOVA will test which of these two (or perhaps both) factors were vital to obtaining a BA. The results again pointed to total credits earned as the most important factor, though number of semesters enrolled was also valuable. Cumulative GPA was not important and though two variables were significant (versus one in Table 7), the amount of explained variance increased only slightly to 72.7%. The strong correlation between the semester enrolled and total credits variables likely lessen the affect the former had on the BA degree outcome.

Since differences could be found among those who earned 60 or more credits versus those who did not, further investigation was conducted on this variable to determine those factors which had influenced it. For this ANOVA, the AA degree, HACC credits earned, and total transfer credits were used as independent variables matched to the dependent total State University I credits earned variable. The findings showed that both total transfer hours and total HACC credits earned were significant but earning an AA was not. Without question the number of accepted transfer credits must have had a great impact on the number of State University I credits earned. It stands to reason that if fewer credits are transferred, more credits will be required at the senior college. Possessing an AA degree was not an important factor

related to total credits earned at State University I. That was also the case in the bivariate analysis but it is not difficult to discern the very close interrelationship between this variable and total HACC credits earned and how the latter mitigated the influence of the former in the ANOVA.

Perhaps the most relevant statistic originating from this ANOVA was the role the transfer credits and HACC credits earned variables played in affecting the total State University I credits earned. To better understand how these factors interacted, data was gathered for only the BA graduates. The findings showed that the mean number of State University I credits earned by a HACC student who graduated with a BA was 76.5. Recall that HACC AA graduates earn an average of 70.8 additional credits from State University I. These students also completed an average of 49.6 credits prior to transferring and on the average, 45.0 credits were accepted by State University I. Thus, while it made little difference whether one transferred with or without an AA, the number of credits accepted for transfer, which was greatly influenced by the number taken at HACC, appear to have a strong, if indirect, impact on the attainment of the BA degree. Students were more likely to do well if they earned at least 45 or more HACC credits and transferred nearly that many. Table 8 lists the results of the ANOVA using State University I credits by AA degree, HACC credits, and total transfer credits.

Table 8
ANOVA - State University I Credits Earned by AA Degree, HACC Credits, and Transfer Credits

Source of Variation	Sum of Squares	DF	Mean Squares	F	Signif.
Main	19.373	8	2.42	2.27	.031
AA Degree	1.109	2	.55	.52	.596
HACC Credits	9.695	3	3.23	3.03	.035
Transfer Credits	17.255	3	5.75	5.40	.002
Explained	19.373	8	2.42	2.27	.031
Residual	76.627	72	1.06		
Total	96.000	80	1.20		

The results, from Table 8 did indicate that the transfer and HACC credit variables were important but when combined with the AA degree factor, they explained only about one-fifth of the variance in State University I credits

earned. This was an important characteristic as it again reinforced a trend whereby HACC based variables generally played a lesser role in directly affecting long-term State University I outcomes.

The ANOVAs clearly showed that many factors, both direct and indirect, are involved in the completion of the BA degree. While a significant impact to State University I outcomes was not apparent by HACC based achievement variables over time, they did play a vital indirect, short-term role as was shown by the total State University I credits earned. Lost among all of the data and statistics is the need to reflect on the total education experience of the transfer students. Since the pressing demand, especially from external agencies, to complete investigations of this nature must be addressed, data gleaned from these types of transfer studies can be of great value to community colleges seeking to strengthen both their programs and their transfer function. The critical factor is to sort out those variables which an institution can affect.

VI. Summary and Conclusion

One of the most compelling issues raised by this study was subsequent academic achievement of HACC transfer students to a senior college, in this case State University I. Simply stated, how well have HACC students fared and by what standards are they measured? Using a sample set of all HACC students who matriculated to State University I during the Fall of 1983, 1984, and 1985, it is apparent that many performed well indeed. If the attainment of a BA degree is used as the standard academic achievement yardstick, the 53% (43 out of 81) figure compares fairly well to the 64% number of State University I native students who complete after six years. It is likely that the BA graduation rate for HACC students would continue to increase over time since an additional 12 transfers had completed 90 or more credit hours as of the Spring, 1989 semester. HACC students have generally performed at a level not unlike native State University I students when comparisons were made related to long-term educational goals.

This level of achievement was not automatic nor did it come easily. First semester "transfer shock" was very apparent. After transferring with a mean

HACC GPA of 2.73, HACC students finished their initial term at State University I with a mean GPA of 2.37. Certainly many transfer students encountered some difficulties in making the transition but once this initial period was over, many rebounded very nicely. This was aptly demonstrated as the cumulative overall GPA for this sample rose to 2.55 (2.80 for AA degree holders) by the end of the Spring, 1989 semester. Though the 2.55 figure did not match the 2.71 overall State University I GPA mean, it did indicate that a marked improvement had been made over time.

Were HACC graduates (those who held an AA or Certificate) more likely to complete the BA degree program? The preliminary data suggested that this variable had little or no impact on the question of whether a BA was earned or not. This is a very important point since this result possibly calls into question the value of the AA degree to the transfer student. However, while the initial analyses revealed little in the way of statistical significance, the addition of six more potential graduates may reverse this particular result. More importantly, the analyses showed that none of the HACC based outcome variables played a direct role in the attainment of the BA. Rather, achievement outcomes at State University I were vital in defining whether a BA degree was earned.

Did this mean that HACC outcomes were not important? No, HACC outcome variables did play an important role, but its affect on the level of State University I achievement diminished or lessened over time. The primary influence HACC variables had on the BA degree was how they acted on short-term State University I variables such as first semester GPA credits transferred, and credits earned. These short-term State University I outcomes in turn acted on the long-term BA variable. Thus, the education experience at HACC was an integral part of the overall academic success experienced by those who transferred to State University I. Moreover, upon closer inspection, a cogent argument can be made related to one's tenure at HACC. BA graduates completed an average of 49 HACC credits and transferred 45 of them to State University I. Given this, it is apparent that students who persisted at HACC for more than one academic year (30 credits) were more likely to earn a four year degree.

The information shared in this study supports the contention that HACC transfers have achieved a large measure of academic success. While an analysis of specific subsequent course achievement after transfer was difficult to complete due to the generally small data set, students have not found their time spent at HACC to be an educational liability. Even as HACC students succeed, one continual issue which must be addressed is the on-going effort to improve and strengthen both the transfer function and programs.

No doubt, HACC students have matriculated to State University I, earned good grades, and many either graduate or are on the verge of doing so. But this was not true for all students nor across all academic programs. For example, why are HACC business majors more likely to change major? Why doesn't the HACC experience have a significant influence on long-term academic goals? What, if anything, can be done to ameliorate the so called "transfer shock" and ensure that more students have a successful first semester, which this study found had an impact on subsequent academic achievement? Do transfer students to State University I differ from those who transfer to other institutions? If so, in what ways? These and other concerns are all valid and it behooves HACC to continue to study those factors which have both a positive and negative effect on the transfer process and academic achievement at the senior institution. New partnerships are required whereby institutional differences (e.g. community college versus university) are not impediments for students who seek to continue their education. Perhaps the greatest barrier educators must overcome is the "inferior" perception associated with attendance at a community college by many at the senior institutions. Students can and have achieved; many raising their expectation from enrollment in a single course, to completing an AA, and ultimately pursuit of the BA degree. Community colleges must not be defensive for they do provide real educational opportunity for many who may not otherwise ever be able to participate in higher education. Likewise, senior colleges and universities must become more accepting of the learning which has taken place at the community college for transfer students have succeeded at their institutions.

Finally, a word of caution. This report generated much data and added to HACC's understanding of the transfer process and the subsequent academic achievement of those who move on to a senior institution. However, it must be

emphasized that the data set came from only one university and for a selected group of students. One must exercise great care in generalizing these findings for all State University I transfers, to say nothing of other students enrolled at other colleges and universities. This is the first of three planned reports and it should not be viewed as the HACC's definitive work in the area of transfer students. More research is required before any encompassing conclusions can be drawn related to how much and how well HACC students succeed academically after they transfer.

References

Much has been written about community college students, the transfer process, and the academic achievement of transfers at senior institutions. Listed below are a few sources which review many of the issues discussed in this study.

Astin, A. W. (1977). Four Critical Years: Effects of colleges on Beliefs, Attitudes, and Knowledge. San Francisco: Jossey-Bass.

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Kinnick, M. K. and Kempner, K. (1988). "Beyond 'Front Door' Access: Attaining the Bachelor's Degree." Research in Higher Education 19 (4): 299-318.

Nunley, C. R. and Breneman, D. W. (1988). "Defining and Measuring Quality in Community College Education." In J. Easton (ed.), Colleges of Choice, pp. 62-92. New York: ACE, Macmillan.

Appendices

Appendix A

SEX

	Frequency	Percent	Cumulative Percent
Male	28	34.6%	34.6%
Female	53	65.4%	100.0%
	81	100.0%	

AGE*

	Frequency	Percent	Cumulative Percent
Less Than 20 Years	22	27.2%	27.2%
20-22 Years	38	46.9%	74.1%
23-25 Years	9	11.1%	85.2%
26-29 Years	5	6.2%	91.4%
30-39 Years	6	7.4%	98.8%
Greater Than 45 Years	1	1.2%	100.0%
	81	100.0%	

*Age at time of transfer to State University I

RACE

	Frequency	Percent	Cumulative Percent
Black	1	1.2%	1.2%
Hispanic	1	1.2%	2.4%
Asian	5	6.2%	8.6%
White	74	91.4%	100.0%
	81	100.0%	

ACADEMIC MAJOR AT HACC

	Frequency	Percent	Cumulative Percent
Business	24	29.6%	29.6%
Communications/Arts	6	7.4%	37.0%
Science/Allied Health	10	12.4%	49.4%
Engineering/Technology	7	8.6%	58.0%
Social Science	22	27.2%	85.2%
General Studies	12	14.8%	100.0%
	81	100.0%	

Appendix A

ACADEMIC MAJOR AT STATE UNIVERSITY I*

	Frequency	Percent	Cumulative Percent
Business	7	16.3%	16.3%
Communications/Arts	6	14.0%	30.3%
Science/Allied Health	4	11.6%	41.9%
Engineering/Technology	5	9.3%	51.2%
Education/Social Science	21	48.8%	100.0%
	43	100.0%	

*Graduates of State University I Only

SEMESTERS ENROLLED AT STATE UNIVERSITY I

	Frequency	Percent	Cumulative Percent
One-Two Semesters	20	24.7%	24.7%
Three-Four Semesters	10	12.3%	37.0%
Five-Six Semesters	23	28.4%	65.4%
Seven-Eight Semesters	15	18.6%	84.0%
Greater/Equal Nine Semesters	13	16.0%	100.0%
	81	100.0%	

Mean Number of Semesters Enrolled at State University I = 5.4

CREDITS EARNED AT STATE UNIVERSITY I

	Frequency	Percent	Cumulative Percent
Less/Equal 30 Credits	25	30.9%	30.9%
31-60 Credits	8	9.9%	40.8%
61-90 Credits	35	43.2%	84.0%
Greater Than 90 Credits	13	16.0%	100.0%
	81	100.0%	

Mean Number of Credit Earned at State University I = 57.8

CREDITS TRANSFERRED TO STATE UNIVERSITY I

	Frequency	Percent	Cumulative Percent
Less/Equal 15 Credits	10	12.3%	12.3%
16-30 Credits	21	26.0%	38.3%
31-45 Credits	13	16.0%	54.3%
Greater Than 45 Credits	37	45.7%	100.0%
	81	100.0%	

Mean Credits Transferred to State University I = 40.5

Appendix A

FIRST SEMESTER GPA AT STATE UNIVERSITY I

	Frequency	Percent	Cumulative Percent
Less Than 2.00	23	28.4%	28.4%
2.00-2.49	22	27.2%	55.6%
2.50-2.99	13	16.0%	71.6%
3.00-3.49	14	17.3%	88.9%
Greater/Equal 3.50	9	11.1%	100.0%
	81	100.0%	

*Mean First Semester GPA Earned at State University I = 2.37

CUMULATIVE GPA AT STATE UNIVERSITY I

	Frequency	Percent	Cumulative Percent
Less Than 2.00	18	22.2%	22.2%
2.00-2.49	15	18.5%	40.7%
2.50-2.99	26	32.1%	72.8%
3.00-3.49	14	17.3%	90.1%
Greater Than 3.50	8	9.9%	100.0%
	81	100.0%	

Mean Cumulative GPA Earned at State University I = 2.55

CREDITS EARNED AT HACC

	Frequency	Percent	Cumulative Percent
Less/Equal 15 Credits	6	7.4%	7.4%
16-30 Credits	16	19.8%	27.2%
31-45 Credits	9	11.1%	38.3%
Greater Than 45 Credits	50	61.7%	100.0%
	81	100.0%	

Mean Credits Earned at HACC = 48.1

CUMULATIVE GPA AT HACC

	Frequency	Percent	Cumulative Percent
Less Than 2.00	2	2.5%	2.5%
2.00-2.49	27	33.3%	35.8%
2.50-2.99	29	35.8%	71.6%
3.00-3.49	16	19.8%	91.4%
Greater/Equal 3.50	7	8.6%	100.0%
	81	100.0%	

Mean Cumulative GPA Earned at HACC =2.73

Appendix A

YEARS GRADUATED FROM STATE UNIVERSITY I

	Frequency	Percent	Cumulative Percent
1985	5	11.6%	11.6%
1986	13	30.3%	41.9%
1987	13	30.2%	72.1%
1988	11	25.6%	97.7%
1989	1	2.3%	100.0%
	43	100.0%	

HACC DEGREE/CERTIFICATE EARNED

	Frequency	Percent	Cumulative Percent
AA Degree	30	37.0%	37.0%
Certificate	1	1.3%	1.3%
None	50	61.7%	61.7%
	81	100.0%	

Appendix B

COURSES COMPLETED AT HACC

English 101 - Composition

	Frequency	Percent	Cumulative Percent
A Grade	13	16.0%	16.0%
B Grade	35	43.2%	59.2%
C Grade	19	23.5%	82.7%
D Grade	1	1.3%	84.0%
Did Not Enroll	13	16.0%	100.0%
	81	100.0%	

English 102 - Composition

	Frequency	Percent	Cumulative Percent
A Grade	15	18.6%	18.6%
B Grade	24	29.6%	48.2%
C Grade	19	23.5%	71.7%
D Grade	1	1.2%	72.9%
F Grade	1	1.2%	74.1%
W Grade	1	1.2%	75.3%
Did Not Enroll	20	24.7%	100.0%
	81	100.0%	

English 104 - Technical Writing

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	1.2%
Did Not Enroll	80	98.8%	100.0%
	81	100.0%	

English 106 - Business Communication

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	1.2%
Did Not Enroll	80	98.8%	100.0%
	81	100.0%	

Appendix B

Math 020 - Beginning Algebra

	Frequency	Percent	Cumulative Percent
A Grade	1	1.2%	1.2%
Did Not Enroll	80	98.8%	100.0%
	81	100.0%	

Math 051 - Intermediate Algebra

	Frequency	Percent	Cumulative Percent
A Grade	3	3.7%	3.7%
B Grade	5	6.2%	9.9%
C Grade	13	16.0%	25.9%
D Grade	2	2.5%	28.4%
F Grade	2	2.5%	30.9%
W Grade	1	1.2%	32.1%
Did Not Enroll	55	67.9%	100.0%
	81	100.0%	

Math 103 - College Algebra

	Frequency	Percent	Cumulative Percent
A Grade	4	4.9%	4.9%
B Grade	8	9.9%	14.8%
C Grade	15	18.5%	33.3%
D Grade	5	6.2%	39.5%
W Grade	1	1.2%	40.7%
Did Not Enroll	48	59.3%	100.0%
	81	100.0%	

Math 104 - Trigonometry

	Frequency	Percent	Cumulative Percent
A Grade	5	6.2%	6.2%
B Grade	7	8.6%	14.8%
C Grade	5	6.2%	21.0%
Did Not Enroll	64	79.0%	100.0%
	81	100.0%	

Appendix B

Math 109 Math for Social and Managerial Sciences

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	1.2%
C Grade	5	6.2%	7.4%
D Grade	2	2.5%	9.9%
F Grade	1	1.2%	11.1%
Did Not Enroll	72	88.9%	100.0%
	81	100.0%	

Math 113 - Math for Elementary Teachers

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	1.2%
C Grade	2	2.5%	2.7%
F Grade	2	2.5%	6.2%
W Grade	1	1.2%	7.4%
Did Not Enroll	75	92.6%	100.0%
	81	100.0%	

Math 119 - Pre-Calculus

	Frequency	Percent	Cumulative Percent
A Grade	4	4.9%	4.9%
B Grade	4	4.9%	9.8%
C Grade	5	6.2%	16.0%
D Grade	1	1.2%	17.2%
Did Not Enroll	67	82.8%	100.0%
	81	100.0%	

Math 121 - Calculus

	Frequency	Percent	Cumulative Percent
B Grade	6	7.4%	7.4%
C Grade	7	8.6%	16.0%
D Grade	3	3.7%	19.7%
W Grade	2	2.5%	22.2%
Did Not Enroll	63	77.8%	100.0%
	81	100.0%	

Appendix B

Education 101 - Introduction to Education

	Frequency	Percent	Cumulative Percent
A Grade	4	4.9%	4.9%
B Grade	10	12.3%	17.2%
C Grade	1	1.2%	18.4%
Did Not Enroll	66	81.6%	100.0%
	81	100.0%	

History 103 - American History I

	Frequency	Percent	Cumulative Percent
A Grade	2	2.5%	2.5%
B Grade	13	16.0%	18.5%
C Grade	8	9.9%	28.4%
D Grade	2	2.5%	30.9%
W Grade	2	2.5%	33.4%
Did Not Enroll	54	66.6%	100.0%
	81	100.0%	

History 201 - Western Civilization I

	Frequency	Percent	Cumulative Percent
B Grade	2	2.5%	2.5%
Did Not Enroll	79	97.5%	100.0%
	81	100.0%	

Psychology 101 - General Psychology

	Frequency	Percent	Cumulative Percent
A Grade	14	17.2%	17.2%
B Grade	15	18.5%	35.7%
C Grade	25	30.9%	66.6%
D Grade	2	2.5%	69.1%
Did Not Enroll	25	30.9%	100.0%
	81	100.0%	

Appendix B

Management *

	Frequency	Percent	Cumulative Percent
A Grade	3	3.7%	3.7%
B Grade	5	6.2%	9.9%
C Grade	2	2.5%	12.4%
Did Not Enroll	71	87.6%	100.0%
	81	100.0%	

*Indicates first management course on HACC transcript.

Computer Science *

	Frequency	Percent	Cumulative Percent
A Grade	2	2.5%	2.5%
B Grade	9	11.1%	13.6%
C Grade	8	9.9%	23.5%
D Grade	2	2.5%	26.0%
F Grade	2	2.5%	28.5%
W Grade	3	3.7%	32.2%
Did Not Enroll	55	67.8%	100.0%
	81	100.0%	

*Indicate first computer science course on HACC transcript.

Physics 201 - General Physics

	Frequency	Percent	Cumulative Percent
B Grade	2	2.5%	2.5%
C Grade	5	6.2%	8.7%
Did Not Enroll	74	91.3%	100.0%
	81	100.0%	

Chemistry 121 - Principles of Chemistry

	Frequency	Percent	Cumulative Percent
B Grade	4	4.9%	4.9%
C Grade	4	4.9%	9.8%
Did Not Enroll	73	90.2%	100.0%
	81	100.0%	

Appendix B

Chemistry 101 - General Chemistry I

	Frequency	Percent	Cumulative Percent
A Grade	2	2.5%	2.5%
B Grade	3	3.7%	6.2%
C Grade	11	13.6%	19.8%
Did Not Enroll	65	80.2%	100.0%
	81	100.0%	

Chemistry 102 - General Chemistry II

	Frequency	Percent	Cumulative Percent
B Grade	3	3.7%	3.7%
C Grade	7	8.6%	12.3%
Did Not Enroll	71	87.7%	100.0%
	81	100.0%	

Chemistry 203 - Organic Chemistry I

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	1.2%
W Grade	1	1.2%	2.4%
Did Not Enroll	79	97.6%	100.0%
	81	100.0%	

Accounting 101 - Principles of Accounting I

	Frequency	Percent	Cumulative Percent
A Grade	6	7.4%	7.4%
B Grade	7	8.6%	16.0%
C Grade	6	7.4%	23.4%
D Grade	1	1.2%	24.6%
F Grade	1	1.2%	25.8%
W Grade	3	3.7%	29.5%
Did Not Enroll	57	70.5%	100.0%
	81	100.0%	

Appendix B

Accounting 102 - Principles of Accounting II

	Frequency	Percent	Cumulative Percent
A Grade	1	1.2%	1.2%
B Grade	5	6.2%	7.4%
C Grade	4	4.9%	12.3%
D Grade	2	2.5%	14.8%
Did Not Enroll	69	85.2%	100.0%
	81	100.0%	

Biology 101 - General Biology I

	Frequency	Percent	Cumulative Percent
B Grade	4	4.9%	4.9%
C Grade	2	2.5%	7.4%
W Grade	1	1.2%	8.6%
Did Not Enroll	74	91.4%	100.0%
	81	100.0%	

Biology 102 - General Biology II

	Frequency	Percent	Cumulative Percent
B Grade	4	4.9%	4.9%
C Grade	2	2.5%	7.4%
Did Not Enroll	75	92.6%	100.0%
	81	100.0%	

Biology 121 - Anatomy and Physiology I

	Frequency	Percent	Cumulative Percent
B Grade	2	2.5%	2.5%
C Grade	4	4.9%	7.4%
Did Not Enroll	75	92.6%	100.0%
	81	100.0%	

Appendix B

Literature Course*

	Frequency	Percent	Cumulative Percent
A Grade	3	3.7%	3.7%
B Grade	2	2.5%	6.2%
C Grade	2	2.5%	8.7%
Did Not Enroll	74	91.3%	100.0%
	81	100.0%	

*Indicate first English literature course on HACC transcript.

Appendix C

Courses Completed at State University I University

NOTE: Unless a specific course is indicated, all grades are drawn from courses as they appear chronologically on the State University I transcript. Equivalent HACC courses in parentheses.

Education Course I

	Frequency	Percent	Cumulative Percent
A Grade	4	4.9%	4.9%
B Grade	10	12.4%	17.3%
C Grade	13	16.0%	33.3%
Did Not Enroll	54	66.7%	100.0%
	81	100.0%	

Education Course II

	Frequency	Percent	Cumulative Percent
A Grade	7	8.6%	8.6%
B Grade	11	13.6%	22.2%
C Grade	4	4.9%	27.1%
Did Not Enroll	59	72.9%	100.0%
	81	100.0%	

Psychology Course I

	Frequency	Percent	Cumulative Percent
A Grade	5	6.2%	6.2%
B Grade	9	11.1%	17.3%
C Grade	11	13.6%	30.9%
D Grade	3	3.7%	34.6%
F Grade	2	2.5%	37.1%
Did Not Enroll	51	62.9%	100.0%
	81	100.0%	

Appendix C

Psychology Course II

	Frequency	Percent	Cumulative Percent
A Grade	2	2.5%	2.5%
B Grade	7	8.6%	11.1%
C Grade	2	2.5%	13.6%
D Grade	2	2.5%	16.1%
F Grade	1	1.2%	17.3%
Did Not Enroll	67	82.7%	100.0%
	81	100.0%	

History Course I

	Frequency	Percent	Cumulative Percent
A Grade	7	8.7%	8.7%
B Grade	12	14.8%	23.5%
C Grade	13	16.0%	39.5%
D Grade	3	3.7%	43.2%
Did Not Enroll	46	56.8%	100.0%
	81	100.0%	

History Course II

	Frequency	Percent	Cumulative Percent
A Grade	2	2.5%	2.5%
B Grade	5	6.2%	8.7%
C Grade	4	4.9%	13.6%
Did Not Enroll	70	86.4%	100.0%
	81	100.0%	

Management Course I

	Frequency	Percent	Cumulative Percent
A Grade	1	1.2%	1.2%
B Grade	8	9.9%	11.1%
C Grade	5	6.2%	17.3%
D Grade	3	3.7%	21.0%
F Grade	2	2.5%	23.5%
Did Not Enroll	62	76.5%	100.0%
	81	100.0%	

Appendix C

Management Course II

	Frequency	Percent	Cumulative Percent
A Grade	2	2.5%	2.5%
B Grade	6	7.4%	9.9%
C Grade	4	4.9%	14.8%
D Grade	1	1.2%	16.0%
Did Not Enroll	68	84.0%	100.0%
	81	100.0%	

Nursing Course I

	Frequency	Percent	Cumulative Percent
A Grade	1	1.2%	1.2%
B Grade	1	1.2%	2.4%
C Grade	1	1.2%	3.6%
Did Not Enroll	78	96.4%	100.0%
	81	100.0%	

Nursing Course II

	Frequency	Percent	Cumulative Percent
B Grade	3	3.7%	3.7%
Did Not Enroll	78	96.3%	100.0%
	81	100.0%	

Nursing Course III

	Frequency	Percent	Cumulative Percent
A Grade	1	1.2%	1.2%
B Grade	2	2.5%	3.7%
Did Not Enroll	78	96.3%	100.0%
	81	100.0%	

Appendix C

Computer Science Course I

	Frequency	Percent	Cumulative Percent
A Grade	5	6.2%	6.2%
B Grade	4	4.9%	11.1%
C Grade	6	7.4%	18.5%
D Grade	5	6.2%	24.7%
Did Not Enroll	61	75.3%	100.0%
	81	100.0%	

Computer Science Course II

	Frequency	Percent	Cumulative Percent
B Grade	3	3.7%	3.7%
C Grade	1	1.2%	4.9%
D Grade	3	3.7%	8.6%
Did Not Enroll	74	91.4%	100.0%
	81	100.0%	

Computer Science Course III

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	1.2%
C Grade	2	2.5%	3.7%
F Grade	1	1.2%	4.9%
Did Not Enroll	77	95.1%	100.0%
	81	100.0%	

Physics Course I

	Frequency	Percent	Cumulative Percent
A Grade	1	1.2%	1.2%
B Grade	2	2.5%	3.7%
C Grade	7	8.6%	12.3%
D Grade	2	2.5%	14.8%
Did Not Enroll	69	85.2%	100.0%
	81	100.0%	

Appendix C

Physics Course II

	Frequency	Percent	Cumulative Percent
A Grade	1	1.2%	1.2%
B Grade	1	1.2%	2.4%
C Grade	2	2.5%	4.9%
D Grade	1	1.2%	6.1%
Did Not Enroll	76	93.9%	100.0%
	81	100.0%	

Math-College Algebra (103)

	Frequency	Percent	Cumulative Percent
B Grade	2	2.5%	2.5%
C Grade	5	6.2%	8.7%
D Grade	2	2.5%	11.2%
F Grade	1	1.2%	12.4%
Did Not Enroll	71	87.6%	100.0%
	81	100.0%	

Math-Math for Elementary Teachers I (113)

	Frequency	Percent	Cumulative Percent
A Grade	1	1.2%	1.2%
B Grade	3	3.7%	4.9%
C Grade	6	7.4%	12.3%
D Grade	2	2.5%	14.8%
Did Not Enroll	69	85.2%	100.0%
	81	100.0%	

Math-Math for Elementary Teachers II (114)

	Frequency	Percent	Cumulative Percent
A Grade	2	2.5%	2.5%
B Grade	3	3.7%	6.2%
C Grade	3	3.7%	9.9%
Did Not Enroll	73	90.1%	100.0%
	81	100.0%	

Appendix C

Math-Trigonometry (104)

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	1.2%
D Grade	1	1.2%	2.4%
Did Not Enroll	79	97.6%	100.0%
	81	100.0%	

Math-Statistics (202)

	Frequency	Percent	Cumulative Percent
A Grade	1	1.2%	1.2%
B Grade	3	3.7%	4.9%
C Grade	2	2.5%	7.4%
Did Not Enroll	75	92.6%	100.0%
	81	100.0%	

Math-Pre Calculus (119)

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	1.2%
D Grade	1	1.2%	2.4%
F Grade	1	1.2%	3.6%
Did Not Enroll	78	96.4%	100.0%
	81	100.0%	

Math-Calculus (121)

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	1.2%
C Grade	5	6.2%	7.4%
D Grade	1	1.2%	8.6%
F Grade	2	2.5%	11.1%
W Grade	1	1.2%	12.3%
Did Not Enroll	71	87.7%	100.0%
	81	100.0%	

Appendix C

Math-Calculus II (122)

	Frequency	Percent	Cumulative Percent
B Grade	3	3.7%	3.7%
C Grade	4	4.9%	8.6%
D Grade	1	1.2%	9.8%
Did Not Enroll	73	90.2%	100.0%
	81	100.0%	

Math-Linear Algebra (220)

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	1.2%
F Grade	1	1.2%	2.4%
Did Not Enroll	79	97.6%	100.0%
	81	100.0%	

Math-Calculus III (221)

	Frequency	Percent	Cumulative Percent
B Grade	3	3.7%	3.7%
C Grade	1	1.2%	4.9%
Did Not Enroll	77	95.1%	100.0%
	81	100.0%	

Chemistry-General Chemistry (101)

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	1.2%
C Grade	3	3.7%	4.9%
D Grade	1	1.2%	6.1%
Did Not Enroll	76	93.9%	100.0%
	81	100.0%	

Appendix C

Chemistry-General Chemistry (102)

	Frequency	Percent	Cumulative Percent
C Grade	1	1.2%	1.2%
D Grade	1	1.2%	2.4%
F Grade	1	1.2%	3.6%
Did Not Enroll	78	96.4%	100.0%
	81	100.0%	

Chemistry-Organic Chemistry I (203)

	Frequency	Percent	Cumulative Percent
C Grade	4	4.9%	4.9%
D Grade	2	2.5%	7.4%
F Grade	1	1.2%	8.6%
Did Not Enroll	74	91.4%	100.0%
	81	100.0%	

Accounting-Principles of Accounting I (101)

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	1.2%
C Grade	2	2.5%	3.7%
D Grade	1	1.2%	4.9%
Did Not Enroll	77	95.1%	100.0%
	81	100.0%	

Accounting-Principles of Accounting II (102)

	Frequency	Percent	Cumulative Percent
A Grade	1	1.2%	1.2%
C Grade	2	2.5%	3.7%
Did Not Enroll	78	96.3%	100.0%
	81	100.0%	

Appendix C

Accounting-Intermediate Accounting (201)

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	1.2%
C Grade	2	2.5%	3.7%
Did Not Enroll	78	96.3%	100.0%
	81	100.0%	

Accounting-Intermediate Accounting (202)

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	1.2%
C Grade	1	1.2%	2.4%
Did Not Enroll	79	97.6%	100.0%
	81	100.0%	

Accounting-Income Tax (203)

	Frequency	Percent	Cumulative Percent
D Grade	1	1.2%	1.2%
Did Not Enroll	80	98.8%	100.0%
	81	100.0%	

Accounting-Managerial Cost Accounting (204)

	Frequency	Percent	Cumulative Percent
D Grade	1	1.2%	1.2%
Did Not Enroll	80	98.8%	100.0%
	81	100.0%	

Biology-Principles of Biology (111)

	Frequency	Percent	Cumulative Percent
B Grade	3	3.7%	3.7%
C Grade	6	7.4%	11.1%
D Grade	1	1.2%	12.3%
Did Not Enroll	71	87.7%	100.0%
	81	100.0%	

Appendix C

Biology-General Biology I (101)

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	1.2%
C Grade	2	2.5%	3.7%
D Grade	1	1.2%	4.9%
Did Not Enroll	77	95.1%	100.0%
	81	100.0%	

Biology-General Biology II (102)

	Frequency	Percent	Cumulative Percent
A Grade	1	1.2%	1.2%
C Grade	1	1.2%	2.4%
Did Not Enroll	79	97.6%	100.0%
	81	100.0%	

Biology-Anatomy and Physiology I (121)

	Frequency	Percent	Cumulative Percent
C Grade	2	2.4%	2.4%
Did Not Enroll	79	97.6%	100.0%
	81	100.0%	

English-Composition I (101)

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	4.9%
Did Not Enroll	80	98.8%	100.0%
	81	100.0%	

English-Composition II (102)

	Frequency	Percent	Cumulative Percent
B Grade	1	1.2%	12.3%
Did Not Enroll	80	98.8%	100.0%
	81	100.0%	

Appendix C

Literature I

	Frequency	Percent	Cumulative Percent
A Grade	7	8.6%	8.6%
B Grade	16	19.8%	28.4%
C Grade	9	11.1%	39.5%
D Grade	2	2.5%	42.0%
F Grade	1	1.2%	43.2%
Did Not Enroll	46	56.8%	100.0%
	81	100.0%	

Literature II

	Frequency	Percent	Cumulative Percent
A Grade	1	1.2%	1.2%
B Grade	5	6.2%	7.4%
C Grade	1	1.2%	8.6%
D Grade	2	2.5%	11.1%
Did Not Enroll	72	88.9%	100.0%
	81	100.0%	

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